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AUTHOR Burke, Mary Ellen
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ABSTRACT

A study examined the effects of active learning strategies; namely, visualization, questioning, and prediction, upon the reading comprehension performance of learning disabled students. Subjects were 6 12th grade resource room students. Prior to strategy instruction, students read and were tested on 3 reading selections from the literature-based curriculum for grade 12. Tests consisted of vocabulary identification, multiple choice questions, and true/false statements. Instruction and practice incorporating active learning strategies followed the initial tests. The students were similarly tested on three additional selections from the curriculum. Results indicated that there was no significant difference in the reading comprehension performance of the students prior to, and following, strategy instruction. Findings suggest, however, that students did show effort during the phase when the strategies were taught, using high interest, modified materials. Furthermore, it should be recognized that learning disabled students benefit from frequent reinforcement of a new skill before it can be considered mastered. Adequate time and practice, combined with gradual fading of teacher support is important in providing internalization and generalization of these strategies. (Contains 4 tables of data, related research, 48 references, and pre- and posttest scores. (Author/CR)

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ED 405 552

Does the Teaching of Active Learning Strategies Improve the Reading Comprehension of Learning Disabled Students?

By

Mary Ellen Burke

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ABSTRACT

The purpose of this study was to examine the effects of active learning strategies; namely, visualization, questioning and prediction, upon the reading comprehension performance of learning disabled students. Six 12th grade resource room students participated in the study. Prior to the strategy instruction, students read and were tested on three reading selections from the literature based curriculum for 12th graders. Tests consisted of vocabulary identification, multiple choice questions and true/false statements. Instruction and practice incorporating active learning strategies followed the initial tests. The students were similarly tested on three additional selections from the curriculum. The results indicated that there was no significant difference in the reading comprehension performance of the students prior to, and following strategy instruction. This paper concludes with a discussion of how these results may be influenced by additional factors such as confidence, motivation and the ability to function independently. These variables may have interfered with improved reading comprehension scores following learning strategy instruction.

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I would like to express my appreciation to Dr. Albert J. Mazurkiewicz. His instruction, guidance and encouragement throughout this final phase of the Masters Program, allowed me to remain focused and confident that I would reach my goal.

DEDICATION

As an expression of my love and appreciation for my family, I would like to dedicate my study to my husband, Warren and my children, Christopher, Kevin, Bryan and Maureen. Their ongoing love, patience and words of encouragement remained with me throughout every phase of this paper.

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As learning disabled (LD) youngsters approach high school, their attempts to to deal with the complex demands of the secondary school setting can become overwhelming. Their understanding of knowing how to learn is as critical as their understanding of facts and concepts. Consequently, reading as an active process is of major importance to the field of reading.

One recommendation supported by Duff & Roehler (1981-82) indicates that comprehension instruction is inadequate. Teachers spend very little time actively teaching reading comprehension. Peter Johnston (1985) takes it a step further to explain that there is a common misconception about comprehension instruction. The goal of reading comprehension should not be the comprehension of the instructional text but it should be to improve the reader's "ability" to comprehend.

We, as teachers, should be most concerned about the extent to which students will comprehend another story without teacher assistance. Thus the student becomes active and independent. In addition, the student's participation, through the application of active learning strategies allows them to take control of their own reading. Thomas Nolan (1991) emphasizes the positive impact on motivation and confidence for success as well. Additionally, the acquisition of active learning strategies are significant for helping learning disabled students cope with the demands of the secondary school setting and also prepares them for the demands of a rapidly changing society. The "how to" aspect of tackling a new situation is ever prominent in our society and therefore, learning disabled students as well as other students, need to be able to maintain active involvement with the content and arrive at a meaningful conclusion.

A number of researchers have explored the differences in reading comprehension ability. It has been noted that it may be the by-product of the type of

internal cognitive strategy used by the individual. Wittrock's generative processing model (1981) presents a framework for understanding reading comprehension deficits. The model proposes that in order for the individual student to comprehend, he must extract meaning from the written words. The reader, therefore, must actively participate in the construction of meaningful associations which link the reading material to personal experiences, past learning and stored information. Furthermore, the reader must generate meaning for the written language by creating images (visualization) and verbal transformation.

Similarly, recent studies conducted by Greeson (1986) and McDaniel and Einstein (1986) are consistent with current learning theories which hold that mental imagery (visualization) plays a special role in students' thinking and learning. In studies comparing normal and learning disabled readers, McCoy and Weber (1981) found that the learning disabled child has a smaller image capacity than the normal child. However, this smaller image capacity can be enhanced by visual imagery practice said Clark, Deshler, Schumaker, Alley and Warner (1984) and thus improve the reading comprehension scores in learning disabled students.

In order to successfully introduce this active learning strategy into an educational curriculum, educators must make the students aware of their own capacity for mental imagery according to Greeson & Zigarm (1985).

There is a select group of studies that indicate students with learning disabilities do not automatically employ active learning strategies, such as visualization, questioning and prediction to improve the comprehension of written material. These students with learning disabilities are often characterized as inactive learners, thus not going beyond the reading of words on a page. Their inability to gain meaning from the text and poor task performance are due to the lack of strategies employed while reading. Often, these students are unaware of appropriate cognitive strategies that

can be used to improve their understanding or are unable to initiate or maintain these learned strategies. The degree of the relationship between learning disabled students learning and employing such active reading strategies with the improvement of reading comprehension is an area that requires further study.

Hypothesis

It is hypothesized that students' use of active learning strategies will not significantly improve their reading comprehension performance. It is further hypothesized that students will lack motivation to employ such strategies independently and will require teacher's cuing to initiate a particular strategy while reading.

Procedure

Six perceptually handicapped classified 12th graders, assigned to an English 12 resource room were utilized as the subjects of this study. Initially, the study was begun by choosing three reading selections from their World Anthology text. Over the course of three weeks, the students read one of the three selections in class and discussed elements of the story. During the reading phase, no specific learning strategy instruction took place. To assess the comprehension performance of the students, a test prepared by the publisher, Globe Fearon and teacher was administered. The test consisted of vocabulary identification, along with literal and interpretive multiple choice questions and true/false statements. The test also included several short answer responses.

Following the teaching and testing of the first three selections, the students were

introduced to the use of active learning strategies, namely visualization, questioning and prediction. Throughout the instructional period, the steps of the strategy were discussed, the thought processes involved were verbally modeled and a rationale for each strategy was provided. Each element of instruction was balanced with guided practice so the students gradually assumed independence.

Each of the next three reading selections concluded with a test identical in format and length to those tests given prior to the strategy instruction. Results were recorded and analyzed. An analysis of the mean differences of the students' test results at the literal and interpretive level, both prior to learning strategies and after instruction was made using t tests.

Results

As can be seen in Table I, there was a minor dirfference of 1.8 points between the pre and post test means of samples' vocabulary achievement and this difference was statistically not significant.

Table I

Means, Standard Deviations and t of the Samples' Pre and Post test Vocabulary Definitions

Sample	Mean	Standard Deviation	t
Pre Test	11.50	2.26	1.87
Post Test	13.33	.82	

NS

Table II, on the other hand, reporting results of the pre and post tests for multiple choice comprehension questions was statistically not significant.

Table II

Means, Standard Deviations and t of the Samples
Pre and Post test of Multiple Choice Comprehension Questions

Sample	Mean	Standard Deviation	t
Pre Test	30.67	7.26	.59
Post Test	33.00	6.42	

NS

Table III detailing the pre and post test means of samples' true/false comprehension statements indicates that there is a 1.83 point difference between the pre and post test measure of comprehension using true/false type questions. The t of 2.01 indicates that this difference is not significant. However, the difference is approaching significance.

Table III

Means, Standard Deviations and t of the Samples'
Pre and Post test for True/False Comprehension Statements

Sample	Mean	Standard Deviation	t
Pre Test	10.00	1.10	2.0
Post Test	11.83	1.94	

Table IV indicates the total pre and post test means of samples' total scores and was statistically not significant.

Table IV

Means, Standard Deviations and t of the Samples' Pre and Post Test Total Scores

Sample	Mean	Standard Deviation	t
Pre Test	52.17	8.21	1.39
Post Test	58.17	6.68	

NS

Discussion

The hypothesis of the study was that students' use of active learning strategies will not significantly improve their reading comprehension performance. The results of this study indicate that this was true and, therefore, the hypothesis can be accepted.

There was a minor difference of 1.8 points between the pre and post test samples for vocabulary achievement and therefore, statistically not significant. The difference between the mean of the pre and post test results for the multiple choice comprehension questions was 2.33 points and was, similarly, not significant. Results on the pre and post test results for the true/false statements, on the other hand, were approaching significance at the .05 level.

In analyzing these results, it is concluded that several other factors should be

considered as influences on performance. The students who participated in this study were from a resource room setting. However, prior to this year, they were students who had been in mainstream English classes, experiencing poor performance. As they approached 12th grade resource room English, they lacked confidence in their own ability to be successful. Furthermore, at the start of the year, they demonstrated poor motivation for reading. However, using high interest, modified materials, the students did show effort during the phase when the strategies were taught.

Nevertheless, it was difficult, however, to determine how much effort the students applied when asked to do so independently. It was noted that the students demonstrated an inability to initiate the learned strategies without teacher cuing and, likewise, maintain strategy application consistently throughout the reading.

It should also be recognized that learning disabled students benefit from frequent reinforcement of a new skill before it can be considered mastered. Adequate time and practice, combined with gradual fading of teacher support is of critical importance in order to provide internalization and generalization of these strategies.

LEARNING STRATEGIES: RELATED RESEARCH

In most academic settings, students look at the experience of reading as a means to reproduce information for later evaluation in a testing situation. They do not learn to relate the new information to their past experiences, thus limiting the students in their ability to generalize the information to other academic contents and to apply what they have learned in a meaningful way (Samuels & Eisenberg, 198l). However, according to Wittrock (198l), his generative process model involves the cognitive interactions between the reader's prior knowledge and experience, the context and the text itself. It is designed to allow for maximum transfer of learning and to provide the reader with a means for making useful associations and connections to the written material.

A study was conducted by Flaro (1986) whereby a specific instructional methodology was applied to teach learning disabled students how to read for comprehension. The strategy was based on Wittrock's (1981) generative process model, the research on cognitive and metacognitive processes, visual imagery and verbal mediation. According to the generative learning theory, mental images induce learners to construct relations among the parts of the text, their knowledge and their experience.

Twenty-four elementary students (sixteen boys and eight girls) identified as exhibiting moderate to severe reading comprehension deficits by three resource room teachers participated in the study. Each resource room teacher was provided with an intensive full day in-service training session that involved a step-by-step description of the reading comprehension strategy. They were instructed in the use of visual imagery and verbal mediation strategies. The methodology employed to teach these strategies was based on the research of the authors, Pressley (1976) and Wittrock (1980). The steps included 1) teaching the individual student about the procedure, rationale and purpose, 2) modeling (vocalizing) the strategy so that the student could

identify the steps necessary, 3) practicing on material at the student's current level of reading comprehension and 4) providing immediate feedback regarding the use of visualization and verbal mediation strategies.

Each teacher met with an individual student on a pre-assessment basis. The student was also instructed on how to recognize use of his or her "mind's eye" along with a metacognitive awareness of associated eye movement patterns. The resource room teacher further modeled the reading comprehension procedure, vocalizing about the picture she was generating and how to ask appropriate self-questions as a means for further developing the comprehension of the image.

Initially, the students were taught to use visual imagery to increase reading comprehension abilities. The students were required to read either a sentence or a paragraph depending on their current level of functioning and to create a visual image. Visual imagery techniques were specifically taught to the students. Students were required to determine if the present pictures were a result of past knowledge and experience or whether they were current constructions created mentally to represent the content of the written words.

Verbal mediation strategies were designed to enhance reading comprehension by requiring the students to read a sentence or a passage; create a mental image and then to ask themselves questions about the content of the reading material. The self-questions were based on the five "W's (who, what, where, when and why) and were used to improve and complete the internal image. Each response to a question should generate important information that could be used to create an accurate representation of the story and at the same time make the content more meaningful to the student.

A "t" test for correlated samples was used to determine whether the difference between pretest and post-test means on the CTBS (Canadian Test of Basic Skills) was

statistically significant. The means and standard deviations for the pre and post-test results over a fifteen week treatment period reflected significant improvement in reading comprehension. The results were significant at the .01 level (t = 13.0; df. 23; p.01)

	Pretest	Post Test
Mean	2.33	3.17
S. D.	.31	.52

This comparison reveals a gain in grade equivalent reading comprehension of about eight months over the fifteen week period. To a large degree the results support the findings in literature that LD students can be taught specific cognitive strategies based on visual imagery and verbal mediation to increase reading comprehension (Paivio, 197l; Pressley 1977, Wittrock and Goldberg, 1975).

Foss & Hakes (1978) define imagery as "an ability to internally propose and construct representation of external object or events." In terms of language or reading this could be an internal representation of either the sounds and written symbols or the underlying meaning Piaget and Inhelder (1969) see certain similarities between imagery and language. Imagery, through its ability to represent objects and the past experience of the person, can play a complementary role to language in assisting comprehension.

A study completed by Guttman, Levin and Pressley (1977) consisted of reading stories to kindergarten, second and third grade children under various conditions. These conditions were sets of pictures that only represented the text, instructions to create internal images as the text was read and a control condition of no image instruction and no pictures. The kindergarten children were able to remember more of the texts presented with the full pictures only. However, as the children

increased in age their ability to use partial pictures and internal images to remember texts also increased relative to the control condition. This tends to support Piaget and Inhelder's (1969) argument that children's ability to image becomes more sophisticated over time.

Lesgold, McCormick and Golinhoff (1975) instructed third and fourth grade students to draw simple cartoons of ideas and events depicted in stories after they read them. Following this activity, the children were asked to construct mental images of stories. The students taught the imagery strategy and reminded to use it remembered more than students receiving a more general non-imagery training. Pressley (1976) found a training session in internal image construction of only twenty minutes, aided the comprehension of eight year old children. With older students (secondary and college), Rasco, Tennyson and Boutwell (1975) found that directions to form images and or use drawings aided the comprehension of reading passages (400-2500 words) for all groups.

Kulhavy & Swanson (1975) instructed fourth and sixth grade children to create mental images as they read a twenty paragraph text and took an accompanying test. A second group was only instructed to read carefully. The group using imagery performed more favorably, however, not significantly. Yet, a delayed post-test indicated that the imagery group recalled more than the non-imagery group. It was concluded that students will remember more of a text that they read if they try to construct mental images during their reading.

Anderson & Kulhavy (1972) found that high school seniors instructed to form mental images while reading a 2,000 word passage learned no more than those students asked only to read carefully. However, on post analysis it was found that one-half of the control group used imagery while one-third of the imagery group did not.

Levin (1973) found that visual imagery instruction (think of a picture corresponding to the sentence read) was more beneficial on a reading comprehension task for poor comprehenders with good vocabulary skills than poor comprehenders with low vocabulary skills on standardized tests. The reader with adequate vocabulary skills using imagery read at a slightly higher level than good readers in the reading without imagery condition. This information suggests that imagery helps those readers who have difficulty in obtaining and organizing meaning from the texts. McCoy & Weber (1981) did a comparison on the abilities of normal and learning disabled readers to image texts. The results suggest that learning disabled children have a smaller image capacity than normal children. Wittrock (1983) further noted that the use of imagery to facilitate reading comprehension with younger children should be approached with care. Children below eight or nine years of age seem unable to construct useful images without help.

Paivio's (1971) research has presented a strong case for imagery as a mediating factor in memory and learning. He contended that visual imagery and verbal processes are alternative mental coding systems for the symbolic representation of meaning. Known for his dual-coding theory, Paivio sees the verbal and non-verbal functioning independently but also performing in an integrated way.

Gambrell & Bales (1986) report that good readers process text more consciously and actively than poor readers. This possible difference leads to the thought that when poor readers use mental imagery they may put forth more effort toward integrating information across text which results in more in-depth processing and increased comprehension monitoring. The researchers note that it is important for children to understand the relationship between the strategies they employ, the effort they expend and their level of comprehension monitoring.

A transactional theory presented by Rosenblatt (1986) focuses on the nature of

the relationship between reader and the text. This emphasizes the active role of the reader in "creating" the literary work and the importance of generating a "lived through" experience of the reader during the transaction with the text. According to Rosenblatt (1986), the "lived through" experience results through attention to the personal meaning of the text. Imagery seems to be related to the perceptual, affective and experiential components of prior knowledge that are likely to affect reader's response. Recent work by Sadoski (1985) suggests that imagery often plays an important role in allowing the reader to enter the secondary world of the text, thereby making the stories "come to life" for the reader.

Long, Winagrad & Bridge (1989) found that a reader's interest in a text is an integral part of reading comprehension. In studies of interest, researchers considered the reader's general attitude toward reading and found it was significantly related to a combined score for imagery vividness (the strength or clarity of images produced in the mind of the reader). It was further concluded that both interest ratings and comprehension were significantly higher for text versions that contained "image-building" words. For example, features that evoke sensory and emotional descriptors such as analogies, figurative language or climatic points in a story create such "image building."

According to Rasinski (1985), imagery activities should connect sign and symbol. The activities should join language to images and images to language. The language could be verbal as well as mental. Thus, imagery can be used as a comprehension strategy using a variety of activities:

1. Have a student read a text and make a drawing of what he or she read. A second student reads the text and reacts to the first student's drawing. After discussion, they develop a new drawing.

2. Have all students draw pictures from a text they read, and compare their

drawings and reactions.

3. Have students write a text, after seeing a picture, that changes the still picture into a dynamic episode. Share the texts and have students decide which text most accurately represents the picture.

4. Use pictures when reading a book to children. Try sharing the pictures before, during, and after reading.

5. Use facsimile artifacts related to a character in evoking images in children before or during a book. These aid in building a background of knowledge for the reading.

6. Allow students to see movies or filmstrips of stories prior to reading them. After the reading, discuss which version was preferred.

7. Following stories they have read, allow students to draw pictures or dramatize certain events from the story.

8. Extend a completed story by having students draw an eight or twelve frame cartoon of a succeeding chapter.

9. Describe an ordinary item, orally or in writing, by its elements. Have students draw a representation of the object from the verbal description. Compare drawings.

10. Show the students only a portion of a picture. Ask them to verbally, using oral or written language, describe the entire picture.

11. Have students hypothesize an upcoming chapter or episode in a book by drawing a cartoon of their predictions. Then do an evaluation of their predictions.

In addition to visualization and verbal mediation, significant research has been done to validate the importance of self-questioning as a student reads to help improve comprehension.

Students see teachers asking questions for a variety of purposes. Through questioning, teachers initiate, elaborate and direct the course of talk in a discussion.

Through questioning teachers can also determine whether or not students have read the text and how well they understood it. Questions are valuable because they promote thinking, productive learning and retention of information. The quality of questioning strategies employed is critical in order to engage the students in successful discussions which should ultimately lead students to effectively question as they read. However, questions can prove to be counterproductive if they are used by teachers simply as a routine and do not transfer to self-questioning within the student. (Williamson, 1996).

Research points to the enhancement of the comprehension process by having teachers model questions at various points during reading, then phasing out teacher questioning and phasing in student's self-questioning (Nolte & Swinger, 1985). Self-questioning is a metacognitive process of reading which enables the student to become independent in their understanding of text because they are actively engaged through goal directed, organized thinking.

Dolores Durkin's research (1978-79) on reading instruction, observed that teacher-posed questions focused on right or wrong answers. Little attention was given to direct instruction of comprehension and the promotion of questioning strategies that leads to the metacognitive development of self-questioning for the purpose of comprehension.

Duffy, Roehler & Herrmann (1988) support the practice of "mental modeling." This is the process teachers perform while making their own reasoning visible to the learner. The process shows students how to activate their own background knowledge and to articulate their own thinking. Because the poor reader may experience difficulty articulating his or her thinking processes during an activity, the teacher's mental modeling needs to incorporate a sharing of these key components including the language and vocabulary necessary for its articulation

(Heller, 1986).

Herrmann (l988) states the benefits of reciprocal teaching for the remedial reader. Consisting of four activities: (a) summarizing and self-review, (b) questioning, (c) clarifying, and (d) predicting. Each of the four activities needs to be staged by the teacher in conjunction with a meaningful piece of text. After each selection, the teacher models the appropriate thinking for the four reciprocal thinking activities. When the teacher completes the initial modeling of the four activities, one of the students from the group then assumes the teacher's role and processes through the described steps. The teacher provides cuing necessary for these activities to be accomplished successfully.

Menke & Pressley (1994) refer to a technique called "elaborative interrogation" as a strategy that leads students to activate prior knowledge and tie it to new knowledge, thus making the text more comprehensible and memorable. Elaborative interrogation is a question intervention which serves as a method for learning material presented in factual prose or as factual statements. The "why" questioning takes advantage of student's prior knowledge or experience in order to make relationships between facts more understandable.

The effect of elaboration has been demonstrated in a recent experiment (Pressley, McDaniel, Turnure, 1987). Canadian college students were asked to remember facts about each of the Canadian provinces. The most important finding was that memory of facts was greatly improved when students answered "why" questions, e.g. "Why would the Yukon be the province with the highest percentage of its people working for the federal government?" This approach was termed elaborative interrogation because the questions required students to generate elaborations and these apparently facilitated learning.

Wood, Pressley & Winnie (1990) demonstrated that similar elaborative

interrogation benefits could be obtained with children. Students in grades four through eight were presented with paragraphs containing information about animals. Each paragraph contained six pieces of information about an animal. Students in the elaborative interrogation condition were taught to respond to each factual statement as a "why" question (e.g. "Why does the seal live with a group of other seals?") While the control participants spent an equivalent amount of time studying the material, elaborative interrogation students remembered more of the facts.

Thomas Nolan (1991) wanted to determine if a strategy that combined two cognitive strategies, self-questioning and prediction would produce higher comprehension scores when compared with either a self-questioning strategy or a more traditional vocabulary-based instruction. Research completed by Wood (1988), led Nolan to hypothesize that the self-questioning strategy with prediction strategy would require the more active involvement of the reader with the text since it combines two cognitive strategies shown to be related to successful comprehension.

Self-questioning directs the learner's attention to critical aspects of the text thereby increasing understanding of important elements. Prediction provides a purpose for reading because readers anticipate coming events in the passage. Motivation is increased by the anticipation of discovering whether one's hypothesis will be confirmed.

Blanton, Wood & Moorman (1990) see prediction as another means for improving comprehension as it activates a plan to guide the student during reading. Kletzien & Bednar (1988) observed that readers have difficulty with comprehension because they have no personal involvement in the assignment. However, through prediction, the reader experiences increased motivation since the reader has a personal investment in the reading task.

The results of a study completed by Nolan (1991) indicated that poor

comprehenders who used the combined strategy of self-questioning and prediction scored higher on a reading comprehension test than did students who used either self-questioning alone or a traditional vocabulary intervention. Nolan's research confirmed that supplementing self-questioning with prediction forces poor comprehenders to monitor the events in the passage more actively, not only in an attempt to seek out answers to their questions, but also to discover whether predictions will be confirmed.

A study completed by Clark, Deshler, Schumacher, Alley and Warner (1984) applied a specific instructional methodology to teach two learning strategies: visual imagery (Lesgold, McCormick & Golinhoff, 1975) and questioning (Manzo, 1969). Both techniques have been advocated as techniques to improve reading comprehension in LD students. Through this study, LD adolescents were taught these strategies to increase interaction with the content and to facilitate reading comprehension.

During implementation of these strategies students were not taught how to judge when to apply one strategy or the other. It is probable that the visual imagery strategy may be applied more easily to some types of materials than to other types. For other materials, the self-questioning strategy may be the strategy of choice.

Another approach, unlike self-questioning as one reads, is direct instruction of the questioning process following reading. Swicegood & Parsons (1989) expressed the need for teachers to make students aware of this process. The strategies they propose provide for direct instruction of the skills involved in asking good questions. For each strategy, the amount of aid or scaffolding the teacher gives, should be adapted to the individual learner, decreased as the learner's skill level increases and increased as the difficulty of the tasks increases (Greenfield, 1984).

Referring to Raphael (1986), the author defines four types of QAR's

(question/answer relationships).

1. Right There questions can be answered directly from one or two sentences of the text and are typically literal and detailed in nature.

2. Think & Search questions have answers which appear in the material but which bring several places of text together such as putting concrete events in sequence. These must be put together because the answer is not found in just one sentence.

3. Author and You involves the learner's prior knowledge which requires the learner to form inferences and conclusions.

4. On Your Own questions cannot be answered from the text, which means that the learner must use his or her own experience.

These questioning variations likewise, employ a phase-in phase-out approach in which teachers model questions initially but gradually transfer more responsibility to students for generating questions.

Swicegood and Parsons (1989) recommend practice activities for improving students' questioning:

Mock Press Conferences - Students work individually or in small groups and prepare brief reports about an interesting topic. The other students take the role of reporters and ask questions about the topic. It is suggested that a real-world model of videotaped excerpts from a presidential press conference be used for motivation. The students should be asked to anticipate potential questions and formulate answers in advance.

Predict and Question (P & Q) Game - This is a simple and highly motivating game for younger children. Start the game with a question: "What do you think this story will be about?" Divide students into two teams. The first team makes predictions and the second team questions the predicting team about the reasons for the

predictions. Tally points for predictions and questions.

Questions I Would Ask - This is a favorite for either history or language arts classes. Make a historical figure or author come alive by questioning him or her. One version has no limit to the kinds of questions asked - personal questions are just as acceptable as those related to historical or literary events.

Jeopardy - The answers are presented to the students and students generate the questions. This format helps even the most reluctant student get involved. Any subject can be used because one goal of the game is to reinforce student questioning behaviors.

Make Up Your Own Test - Good students and good test takers have been shown to have a high degree of success in predicting the questions teachers ask on tests. Give all students practice in making up potential test questions. This activity improves questioning skills and might improve test performance of students as well.

Tama & Martinez (1986) reviewed research in teaching reading comprehension and developed several generalizations:

(a) there are differences in reading comprehension between LD students and non-learning disabled students

(b) teacher directed instruction during reading increases comprehension

(c) LD readers may be taught self-monitoring during reading to improve comprehension.

Tierney & Cunningham (1984) present a model for looking at reading comprehension. In their trichotomy activities occur before, during and after reading text information.

TELLS, FACT OR FICTION - (Idol-Maestas, 1985) is a guided comprehension probe to orient students to stories prior to reading. The acronym is intended to remind students of the steps in the process: T - study the title; E - examine the pages to find

out what the story is about; L - look for important words; L - look for hard words; S - identify setting and FACT or FICTION - Decide whether the story is a factual o fictional work.

Idol-Maestas (1985) used this technique with four LD elementary students and two secondary students from special education classes. The overall results showed that after training reading comprehension improved for both the elementary and secondary students as measured by standardized tests and by curriculum based assessment. The students required most assistance with looking for clues, important words and difficult words. A limitation of this study was that improved comprehension did not maintain well after the probing technique was removed.

A second activity shown to be helpful is story mapping. This is a schema building technique. Rumelhart (1980) asserts that schemata (reader's prior knowledge) may be thought of as the fundamental element upon which all information processing depends. The story mapping instructs the reader about the interrelated parts of a story which provides a framework that helps the reader focus attention on the common elements among stories such as the setting, characters, problems, outcome and conclusion (Idol, 1987).

The third activity follows the thoughts of Raphael (1982) who proposes the QAR or four methods of questioning. He advocates careful planning when instructing students with disabilities in the use of QAR's. Initially, the teacher should serve as a model for asking questions, directly designating various examples as specific types of QAR's. Students should be furnished with reading passages that are already marked pointing out various QAR's. A wall chart defining the four types could be used to cue students who are experiencing difficulty in either locating or designating a type of QAR. The first two would be labeled "In the Book," while the last two are termed "In the Head." Raphael also recommends that the two types of QAR's be taught separately.

This procedure seeks to move learners in the direction of relying both on information contained in the reading material and on their own wealth of prior knowledge

Swicegood & Parsons (1989) recommends that teachers be aware of the following principles when working on questioning behavior for individuals or small groups of students:

1. Use the procedure frequently to give students practice in using it.

2. Give students extra time to survey material and generate questions or predictions.

3. Read aloud or assign a peer to read aloud for students with limited silent reading ability.

4. Use in conjunction with repeated reading (reading the same selection several times in one session) to allow students to devote more attentional capacity to comprehension.

5. Encourage the student to tap his or her own store of knowledge first.

6. Model and cue.

7. Use a variety of materials. For initial practice in questioning, use materials that contain predictable vocabulary and are based on the students' prior knowledge (e.g., trade magazines, books or articles based on television or movies).

Teaching students strategic reading skills does not guarantee independent use and transfer to other reading situations. Students must not only practice these strategies actively but also regard them as useful and relevant to school learning. Swicegood & Parsons (1989) suggest that teachers who present these strategies in an active, meaningful context will increase their students' chances of ultimate success.

Furthermore, the chances that an individual student will use a strategy are greatly increased when teachers work cooperatively with each other and carry the skill across the curriculum. The goal of teaching active learning strategies to improve

reading comprehension is automaticity. Our task is not complete until that is achieved.

REFERENCES

Anderson, R. C. and R. W. Kulhavy. "Imagery and Prose Learning." Journal of Educational Psychology, 63, 1971, 242-243.

Blanton, W. E., K. D. Wood and G. B. Moorman. "The Role of Purpose in Reading Comprehension." The Reading Teacher, 43, 1990, 486-493.

Clark, F. L., D. D. Deshler, J. B. Schumacher, G. R. Alley, and M. M. Warner. "Visual Imagery and Self-Questioning: Strategies to Improve Comprehension of Written Material." Journal of Learning Disabilities, 17, 1984, l45-149.

Duffy, G. G., L. R. Roehler, and B. A. Hermann. "Modeling Mental Processes Help Poor Readers Become Strategic Readers." The Reading Teacher, 41, 1988, 762-767.

Durkin, D. "What Classroom Observation Reveals About Reading Comprehension Instruction." Reading Research Quarterly, 14, 1978-79, 481-533.

Flaro, L. "The Development and Evaluation of a Reading Comprehension Strategy with Learning Disabled Students." Reading Improvement, 24, 1987, 222-229.

Foss, D. J. and D. T. Hakes. Psycholinguistics. Englewood Cliffs, New Jersey: Prentice-Hall, 1978.

Gabrell, L. , B. Bales, J. Ruby. " Mental Imagery and the Comprehension Monitoring Performance of Fourth and Fifth Grade Poor Readers." Reading Research Quarterly, 1986, 454-466.

Gabrell, L. and P. Brooks Jawitz. "Mental Imagery, Text Illustrations and Children's Story Comprehension and Recall." Reading Research Quarterly, 28, 1993, 265-273.

Greenfield, P. M. "A Theory of the Teacher in the Learning Activities of Everyday Life." Everyday Cognition: Its Development in Social Context, 1984, 117-138.

Greeson, L. E. and D. Zigarivi. "Piaget Learning Theory and Visual Thinking." Humanistic Education and Development, 24, 1985, 40-49.

Greeson, L. E., M. A. McDaniel and G. O. Einstein. "Bizarre Imagery as an Effective Memory Aid." Journal of Experimental Psychology: Learning, Memory and Cognition, 12, 1986, 54-65.

Greenfield, P. M. "A Theory of the Teacher in the Learning Activities of Everyday Life. B. Rogoff and J. Lave (Eds.), Everyday Cognition: Its Development in Social Context, 1994, 117-138.

Gullman, J., J. R. Levin and G. M. Pressley. "Pictures, Partial Pictures and Young Children's Oral Prose Learning." Journal of Educational Psychology, 69, 1977, 473-480.

Heller, M. F. "How Do You Know What You Know?" Metacognitive Modeling in the Content Areas." Journal of Reading, 29, 1986, 415-422.

Hermann, B. A. "Two Approaches For Helping Poor Readers Become More Strategic." The Reading Teacher, 42, 24-28.

Idol, L. "Group Story Mapping. A Comprehension Strategy for Both Skilled and Unskilled Readers." Journal of Learning Disabilities, 20, 1987, 196-205.

Idol-Maestas, L. "Getting Ready to Read: Guided Probing for Poor Comprehenders." Learning Disabilities Quarterly, 8, 1985, 243-254.

Kulhavy, R. W. and I. Swenson. "Imagery Instruction and the Comprehension of Text." British Journal of Educational Psychology, 45, 1975, 47-51.

Lesgold, A. M., C. McCormick, and R. M. Golinkoff. "Imagery Training and Children's Prose Learning." Journal of Educational Psychology, 67, 1975, 663-667.

Levin, J. "Inducing Comprehension in Poor Readers: A Test of a Recent Model." Journal of Educational Psychology, 65, 1973, 19-24.

LLoyd, C. V. "How Teachers Teach Reading Comprehension: An Examination of Four Categories of Reading Comprehension Instruction." Reading, Research and Instruction, 35 (2), 1995-96, 171-185.

Long, P., A. Winagrad and J. Bridge. "Imagery Reported During Reading." Reading Research Quarterly, 1989, 355-372.

Manzo, A. V. "The Request Procedure." Journal of Reading, 13 (2), 1969, 123-126.

McCoy, K., and R. Weber. "Image and Perceptual Representation of Words in Learning Disabled and Normal Children." Learning Disabilities Quarterly, 4, 1981, 76-81.

Menke, D. J. and M. Pressley. "Elaborative Interrogation: Using 'Why' Questions to Enhance the Learning from Text." Journal of Reading, 37:8, 1994, 642-645.

Nolan, T. E. "Self-Questioning and Prediction: Combining Metacognitive Strategies." Journal of Reading, 35:2, 1991, l32-138.

Nolte, R. Y. and H. Singer. "Active Comprehension - Teaching a Process of Reading Comprehension and Its Effects on Reading Achievement." The Reading Teacher, 39, 1985, 24-31.

Paivio, A. Imagery and Verbal Processes. New York: Holt, Rinehart and Winston,\ 1971.

Piaget, J. and B. Inhelder. The Psychology of the Child. New York: Basic Books, 1969.

Pressley, M. "Mental Imagery Helps Eight Year Olds Remember What They Read." Journal of Educational Psychology, 68, 1976, 355-359.

"Imagery and Children's Learning: Putting the Picture in Developmental Perspective." Review of Educational Research, 47, 1977, 585-622.

Pressley, M., M. A. McDaniel, J. E. Turnure. "Generation and Precision of Elaboration: Effects on Intentional and Incidental Learning." Journal of Experimental Psychology: Learning, Memory and Cognition, 132, 291-300.

Raphael, T. E. "Question-Answering Strategies for Children." The Reading Teacher, 36, 1982, 186-190.

"Teaching Question-Answer Relationships Revisited." The Reading Teacher, 39, 1986, 516-523.

Rasco, R., R. Tennyson, and R. Boutwell. "Imagery Instructions and Drawings in Learning Prose." Journal of Educational Psychology, 67, 1975, 188-192.

Rasinski, T. V. "Picture This: Using Imagery as a Reading Comprehension Strategy." Reading Horizons, 24, 1985, 280-288.

Rosenblatt, L. M. "The Aesthetic Transaction." Journal of Aesthetic Education, 20, 1986, 122-128.

Rumelhart, D. Schemata: The Building Blocks of Cognition. Theoretical Issues in Reading Comprehension. Hillsdale, New Jersey: Erlbaum, 1980, 33-58/

Sadoski, M. "The Natural Use of Imagery In Story Comprehension and Recall." Reading Research Quarterly, 20, 1986, 658-667.

Samuels, S. J. and P. Eisenberg. "A Framework for Understanding the Reading Process." In F. J. Pirozzol and M. C. Wittrock (Eds.), Neuropsychological and Cognitive Processes in Reading. New York: Academic Press, I987.

Sorrell, Adrian, J. "Three Reading Comprehension Strategies: Tells, Story Mapping, and QARs." Academic Therapy 25:3, 1990, 359-368.

Swicegood, Philip, R. and J. L. Parsons. "Better Questions and Answers Equal Success." Teaching Exceptional Children, 21, 1989, 4-8.

Tama, M. and D. H. Martinez. "Reading Comprehension and the Learning Disabled Reader: Generalizations form Five Years of Research (1980-85)." Paper presented at the annual meeting of the National Reading Conference, Austin, Texas, 1986.

Tierney, R. and J. Cunningham. "Research on Teaching Reading Comprehension." In P. Pearson (Ed.) Handbook of Reading Research. New York: Longman, 1984, 609-655.

Williamson, R. A. "Self-Questioning - An Aid of Metacognition." Reading Horizons, 37, 1996, 30-47.

Wittrock, M. C. and S. I. Goldberg. "Imagery and Meaningfulness in Free Recall - Word Attributes and Instructional Sets." Journal of General Psychology, 92, 1975, 137-151.

Wittrock, M. C. The Brain and Psychology. New York: Academic Press, 1980.

"Reading Comprehension." In F. J. Pirozzolo and M. C. Wittrock (Eds.). Neuropsychological and Cognition in Reading. New York: Academic Press, 1981.

"Education and Recent Research on Attention and Knowledge Acquisition. In S. Freedman and R. Peterson (Eds.) Neuroscience and Education. New York: Academic Press, 1983.

Wood, E., M. Pressley and P. H. Winnie. "Elaborative Interrogation Effects on Children's Learning of Factual Content." Journal of Educational Psychology, 82, 1990. 741-748.

Wood, K. D. "Guiding Students Through Informational Text." The Reading Teacher, 41, 1988, 912-920.

APPENDIX

Test	Student	Vocabulary	Multiple Choice	True/False
Pre	1	11	22	10
Post		13	32	13
Pre	2	10	40	9
Post		13	37	10
Pre	3	13	26	10
Post		13	23	10
Pre	4	13	36	9
Post		15	36	12
Pre	5	14	35	12
Post		13	41	11
Pre	6	8	25	10
Post		13	29	15